

**1966 OPERATING SUMMARY**

# **TRENTON**

**water pollution  
control plant**

**ONTARIO WATER RESOURCES COMMISSION**

*Division of Plant Operations*

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ONTARIO WATER RESOURCES COMMISSION  
OFFICE OF THE GENERAL MANAGER

Members of the Trenton Local Advisory Committee,  
Town of Trenton.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the  
Trenton Water Pollution Control Plant, OWRC Project No. 57-S-4.

It is hoped that our joint participation in efforts to combat water pollution  
will have even more success in the coming year.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly".

D. S. Caverly,  
General Manager.

LIBRARY COPY

NOV 23 1967

ONTARIO WATER  
RESOURCES COMMISSION



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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VICE-CHAIRMAN

D. S. CAVERLY  
GENERAL MANAGER

W. S. MACDONNELL  
COMMISSION SECRETARY

General Manager,  
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Trenton Water Pollution Control Plant, OWRC Project No. 57-S-4.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in cursive script, appearing to read "B. C. Palmer".

B. C. Palmer, P. Eng.,  
Director,  
Division of Plant Operations.

## FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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**TRENTON**  
**water pollution control plant**

operated for

THE TOWN OF TRENTON

by the

ONTARIO WATER RESOURCES COMMISSION

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Assistant Director:	C. W. Perry
Regional Supervisor:	D. A. McTavish
Operations Engineer:	J. N. Dick

801 Bay Street      Toronto 5

## **'66 REVIEW**

The flow data on the Trenton Water Pollution Control Plant was incorrect for the first ten months of the year. This situation was discovered in about September, 1966, and the plant meter was sent to the manufacturer for repairs. When the repaired instrument was reinstalled the flows increased considerably. Consequently, the flows preceding this correction are in error. The report should be reviewed with this in mind.

The operating costs for Trenton Water Pollution Control Plant in 1966 were \$19,154.53. The operating costs have decreased slightly in 1966 due to some inplant process modifications. Significant changes in the operating costs occurred in payroll due to salary increases. Power costs increased slightly as did chemical costs, primarily due to increased flows to the plant. The cost of general supplies also decreased slightly. The significant change, however, was the decrease in water consumption which decreased approximately \$1,300 due to a plant process change.

The average BOD and Suspended Solids concentrations in the plant influent were 284 and 215 ppm respectively. The concentration of BOD and SS in the effluent was 109 and 79 ppm respectively. This resulted in a BOD reduction of 61.5 percent and an SS reduction of 63 percent. These values are quite satisfactory for a primary treatment plant.

Unusual operating problems occurred in the following areas:

1. The waste gas burner froze in the winter and resulted in considerable work in thawing this line.
2. The supernatant withdrawal pipe from the secondary digester also froze due to a partial blockage and resulted in considerable work to thaw this line.
3. A cave-in occurred around the clarifiers that had to be filled in.
4. Considerable gas piping had to be replaced because of the corroded condition of this pipe which weakened at the threads and broke off at this location.



5. The Powers regulating valve on the Cummins stand-by Diesel in the Dundas Street pumping station was replaced. This replacement resulted in a considerable saving in water which previously was not held back by this valve because of this malfunctioning.

6. All of the flights in the two clarifiers were replaced in 1966.

Considerable flooding still occurred in 1966 in the Dundas Street pumping station due to storm water gaining access to the sewers. It appeared that any storm that contributed a half-inch of rainfall caused flooding problems at this pumping station.

The plant was also broken into in 1966 and the cash box and other items were stolen. This was reimbursed by the insurance policy.

Two modifications were made at the plant by the plant staff in 1966 that resulted in considerable financial saving. The plant effluent was used to supply water to the chlorinator at the plant and also to water the lawn and effect other occasional plant washdowns. The plant staff also installed a grit hoist above the aerated grit chamber to ease and quicken the removal of sand, which gathers very rapidly after a storm, from this tank.

It is our objective to maintain attractive plant grounds at the plant site and the Dundas Street pumping station. This, however, involves considerable time and effort, and the plant staff should be complimented on their efforts in this regard.

The plant flow meter was dismantled and sent to Toronto for repairs and calibration. This resulted in a considerable increase in flows to the plant which originally were thought to have been decreased due to the storm water separation program.

In the month of December, the controls failed on the plant boiler, causing the oil pump to remain in operation when other parts of the boiler were automatically closed down. This resulted in a hazardous condition of oil in the fire box and on the plant floor. This, however, was corrected and cleaned up with no incidents.

In December, 1966, the Chief Operator, Mr. J. Stewart, suddenly became ill and had to spend some time in the Trenton hospital.

The staff of the Trenton WPCP should be commended for the interest that they have shown in the area of water pollution control and in the maintenance and operation of the facilities in Trenton.

## PROJECT COSTS

NET CAPITAL COST (Final)  
Long Term Debt to OWRC

\$515,665.11

Debt Retirement Balance at Credit  
(Sinking Fund) December 31, 1966

\$ 87,746.99

Net Operating

\$ 19,154.53

Debt Retirement

10,406.00

Reserve

2,300.84

Interest Charged

29,012.52

TOTAL

\$ 60,873.89

### RESERVE ACCOUNT

Balance at January 1, 1966

\$ 25,478.55

Deposited by Municipality

2,300.84

Interest Earned

1,402.19

\$ 29,181.58

Less Expenditures

1,811.05

Balance at December 31, 1966

\$ 27,370.53

## MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER
JAN	1103.30	533.09			102.68		6.36			461.17	
FEB	1157.01	505.78		65.52	214.47		23.41		127.75	67.47	152.61
MARCH	1485.06	577.71		176.01	253.33	448.05	152.46		131.61	(381.42)	127.31
APRIL	2373.38	855.42		147.46	156.28	448.05	23.26		33.99	606.36	102.54
MAY	1468.78	612.16			214.66		114.43		369.05	50.02	108.46
JUNE	1676.28	663.87		74.33	187.86	456.75	110.91		15.95	78.34	88.27
JULY	915.05	585.86			208.64		43.46			56.03	21.06
AUG	1397.60	450.70	121.74		233.16	456.75	35.18			98.51	1.56
SEPT	1592.88	937.17	245.04		213.55		50.72		75.00	45.45	25.95
OCT	2064.64	618.88			201.50	456.75	60.91		418.31	291.54	16.75
NOV	1229.85	596.95		81.64	233.06		58.18	77.45	119.41	39.20	23.96
DEC	2690.70	564.00		285.04	454.17	456.75	91.90	184.48	408.56	205.63	40.17
TOTAL	19154.53	7501.59	366.78	830.02	2673.36	2723.10	771.18	261.93	1699.63	1618.30	708.64

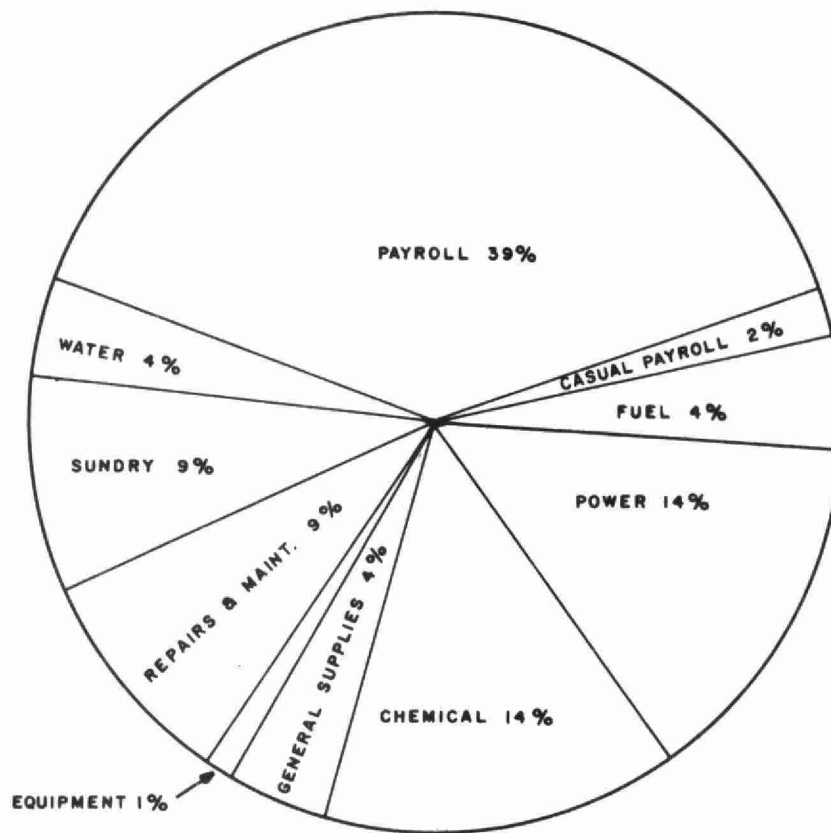
BRACKETS INDICATE CREDIT

## YEARLY OPERATING COSTS

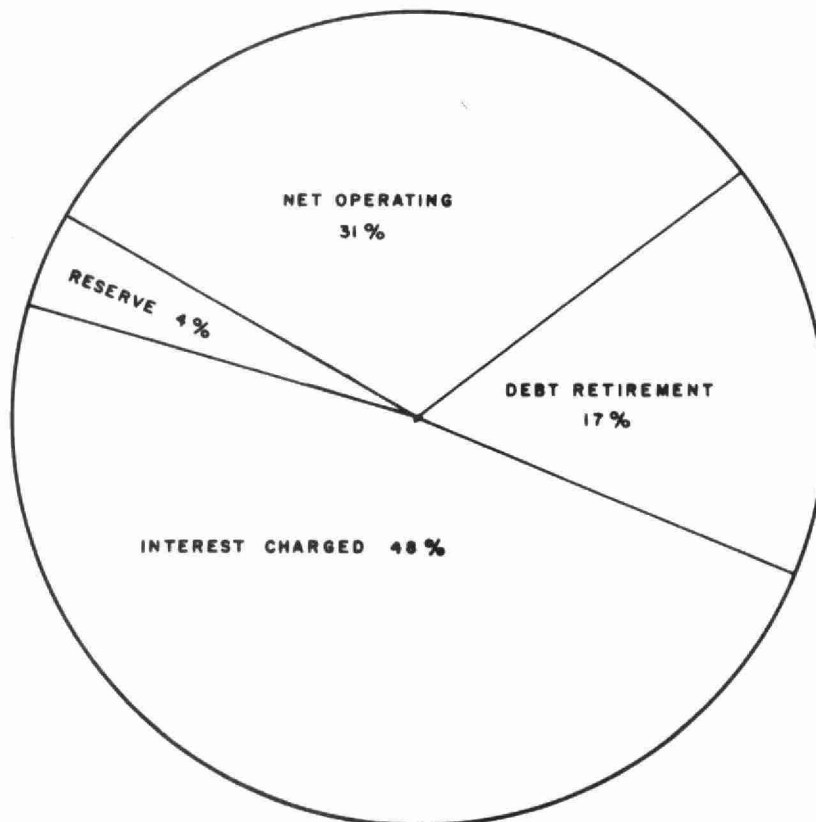
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1962	496.00	\$12,577.44	* \$3.70	\$25.35	2.5 CENTS
1963	384.00	\$12,104.42	\$3.59	\$31.52	5.0 CENTS
1964	184.25	\$18,422.16	\$5.19	\$99.98	12.5 CENTS
1965	214.87	\$19,519.53	\$5.38	\$90.84	5 CENTS
1966	233.76	\$19,154.53	\$5.30	\$81.94	5 CENTS

\* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

## 1966 OPERATING COSTS



## TOTAL ANNUAL COSTS



## **Process Data**

### PROBABILITY OF FLOW

When the probability of daily flow plot is examined it should be remembered that the flow data collected in 1966 was erroneous for the first ten months of the year.

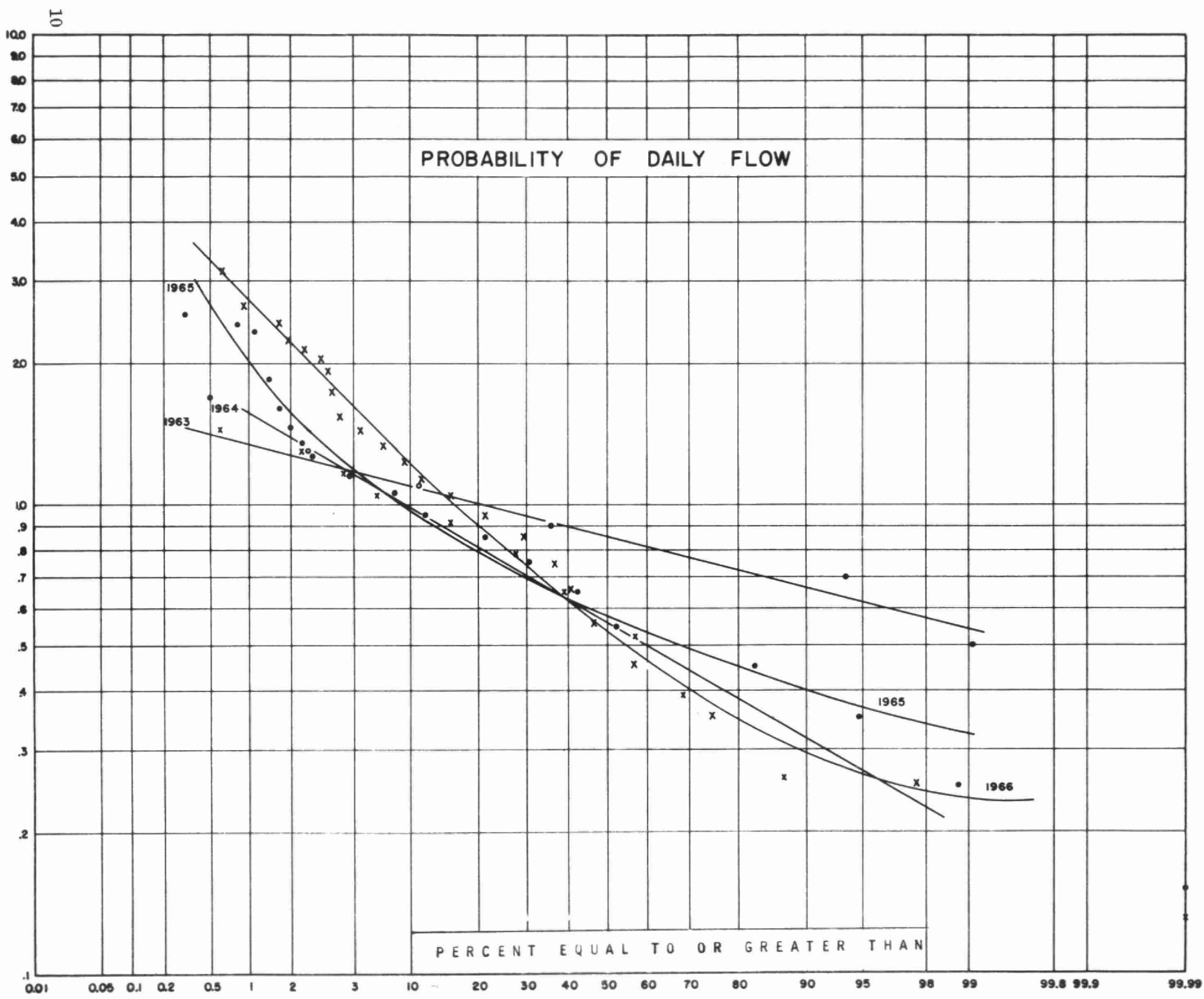
### DAILY FLOWS

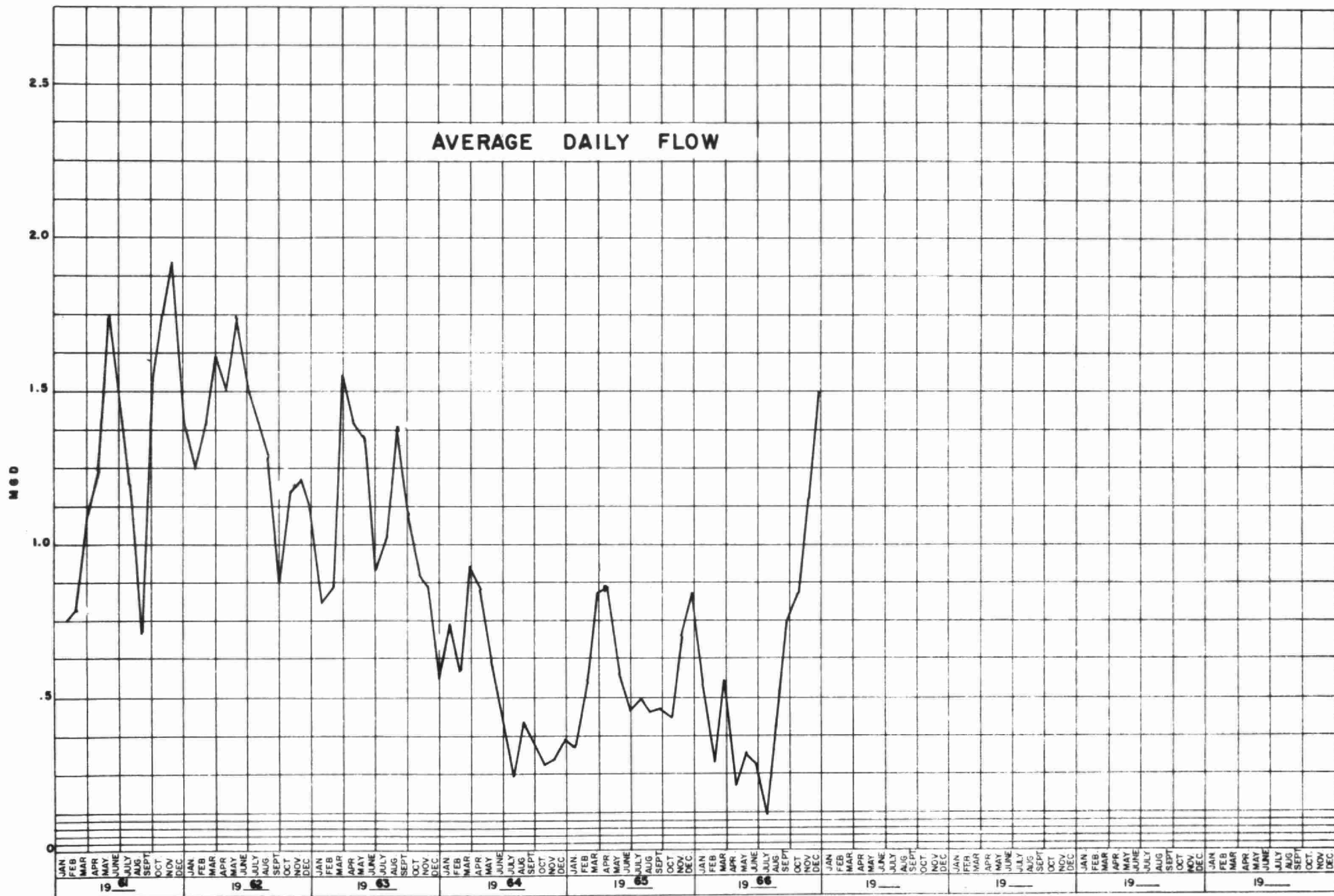
Attention is drawn to the last three months of the year on the daily flow graph. It will be noted here that the average daily flows fluctuate around the one million gallon per day mark. It will also be noted that peak flows due to storm flows frequently exceed the design flow of one million gallons per day by a considerable amount.

MILLION GALLONS PER DAY

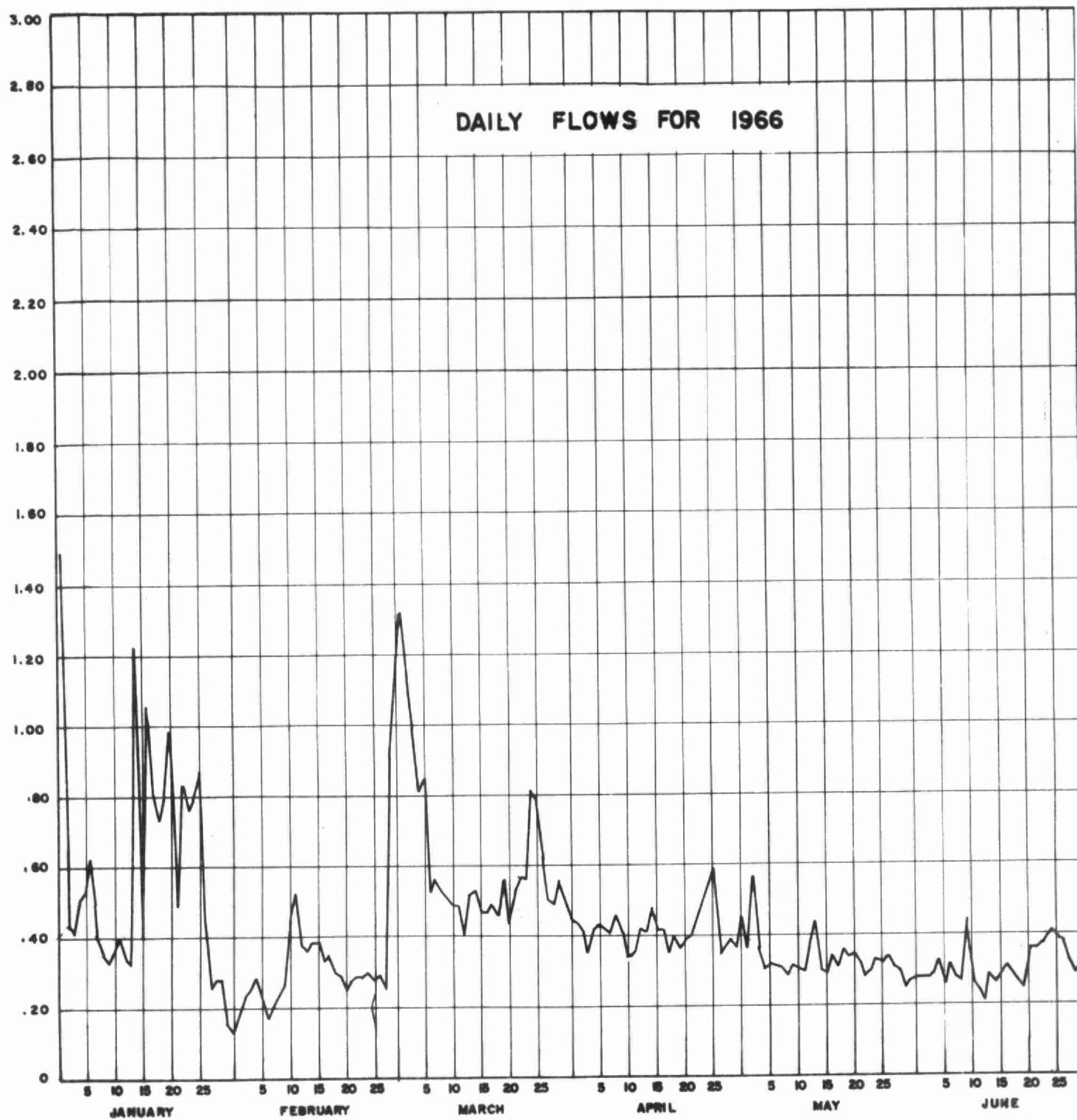
PROBABILITY OF DAILY FLOW

PERCENT EQUAL TO OR GREATER THAN

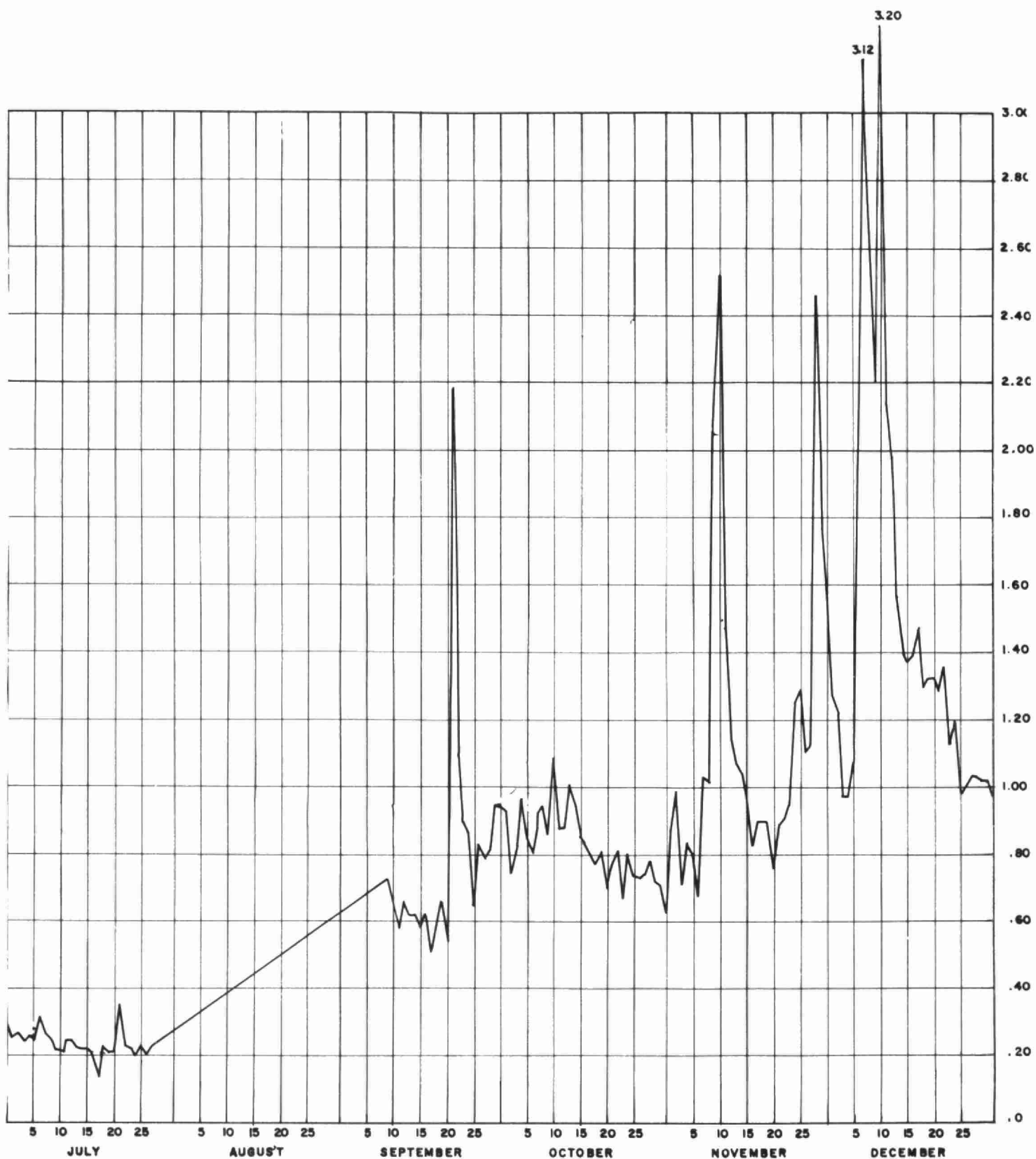


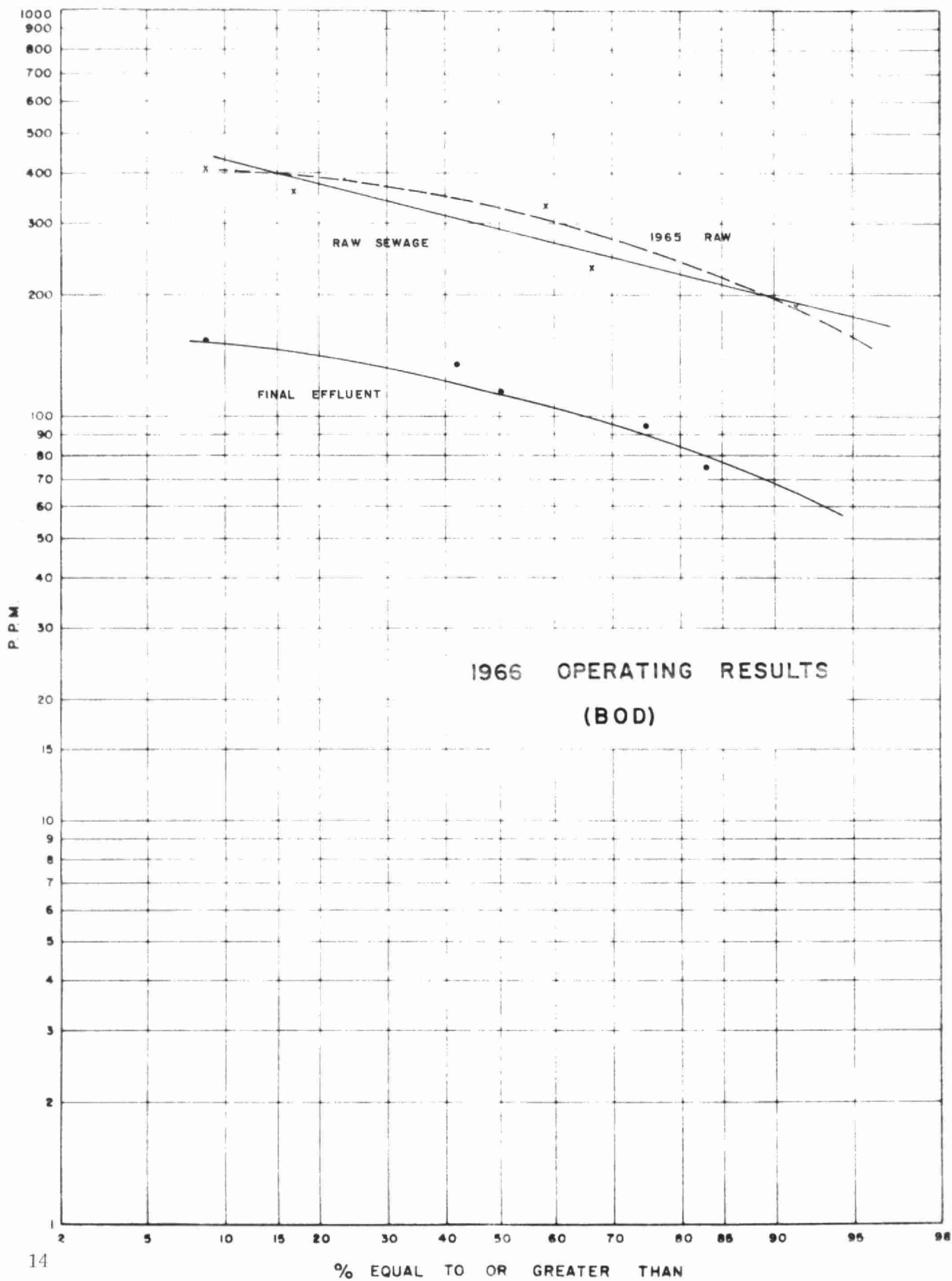


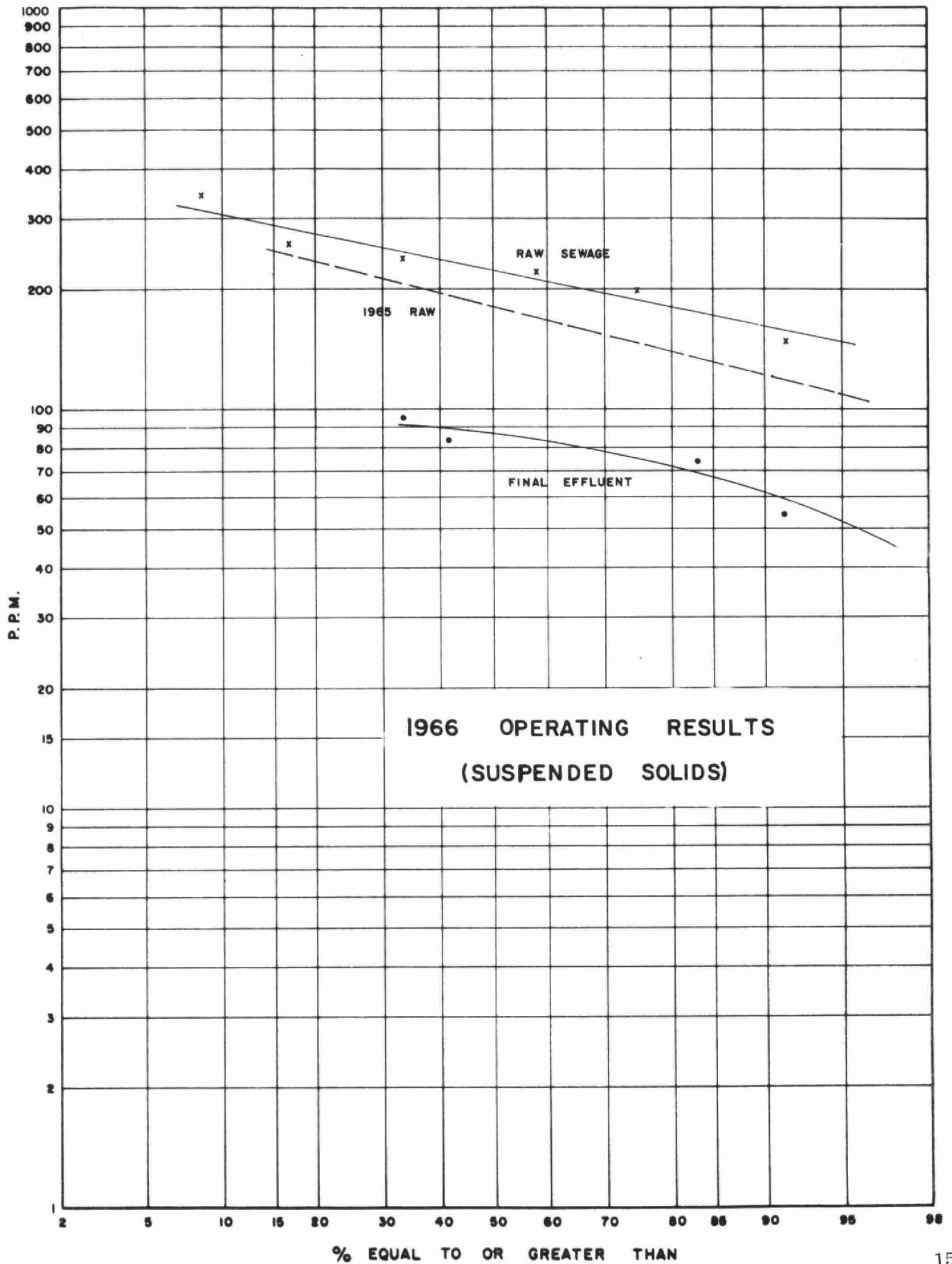
DAILY FLOW M.G.

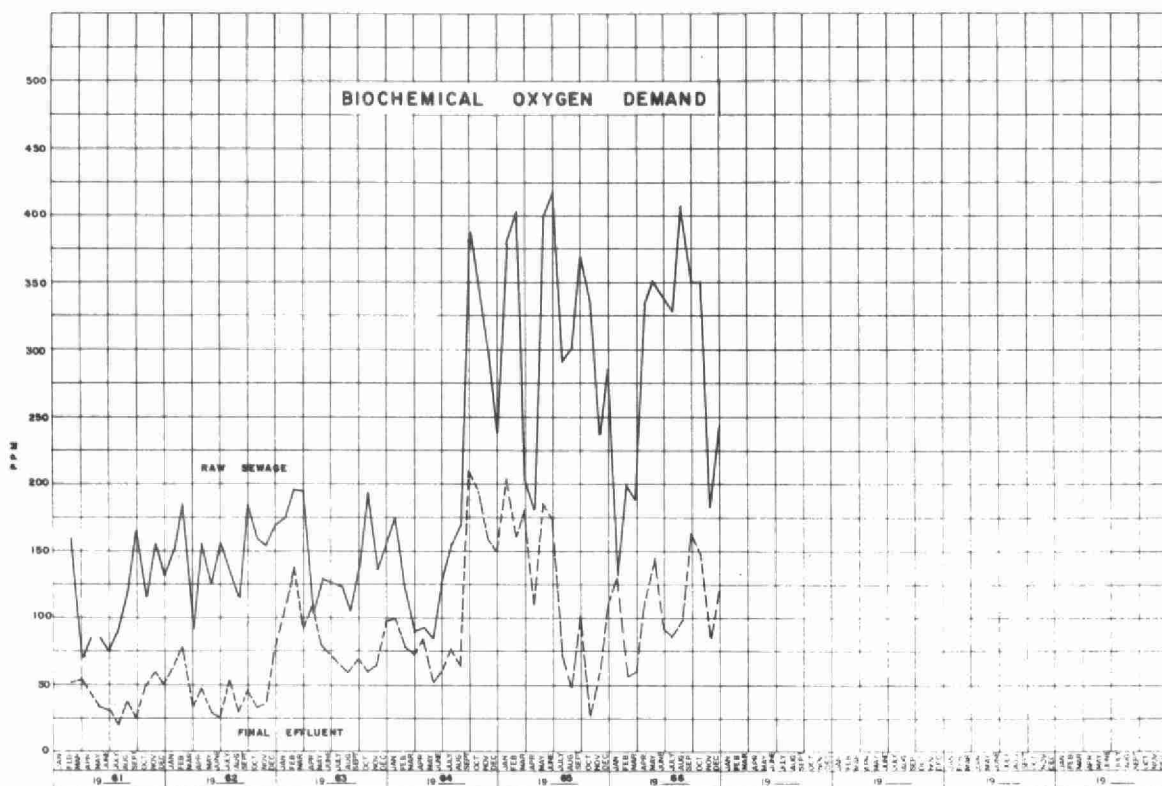




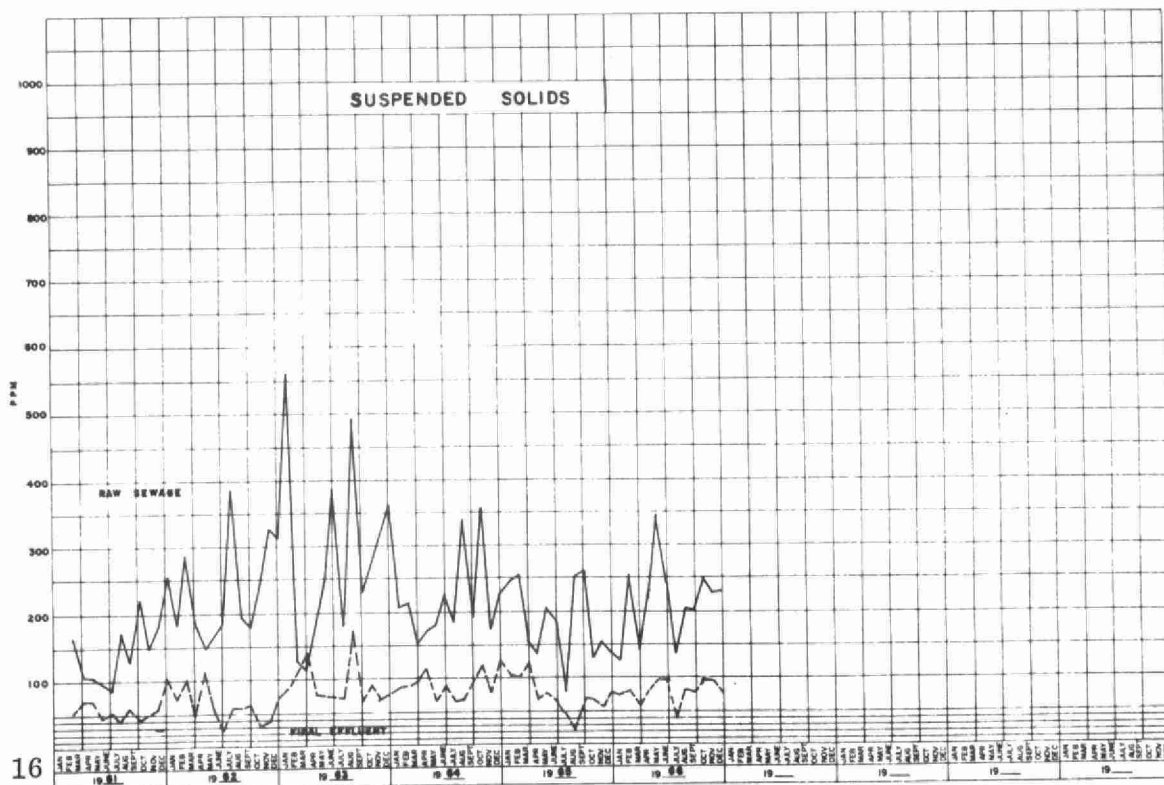








## MONTHLY VARIATIONS



# GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	130	130	0.0	0.0	128	74	42.0	4.8	5
FEB.	200	56	72.0	6.4	256	78	69.5	8.0	20
MAR.	180	60	66.5	11.4	142	59	58.5	7.8	77
APR.	335	114	66.0	13.6	224	80	64.5	8.8	24
MAY	355	144	59.5	10.9	343	97	71.5	12.5	39
JUNE	340	92	73.0	11.5	240	97	59.5	6.6	41
JULY	330	86	74.0	9.1	136	38	72.0	3.6	50
AUG.	410	98	76.0	* 31.0	204	82	60.0	* 12.1	80
SEPT.	350	165	53.0	21.1	202	78	61.5	14.1	69
OCT.	350	145	58.5	26.2	250	96	61.5	19.7	13
NOV.	180	84	53.5	16.8	226	94	58.5	22.9	70
DEC.	243	129	47.0	26.2	228	76	66.5	34.9	50
TOTAL	-	-	-	204.5	-	-	-	159.0	538
AVG.	284	109	61.5	17.0	215	79	63.0	13.2	45

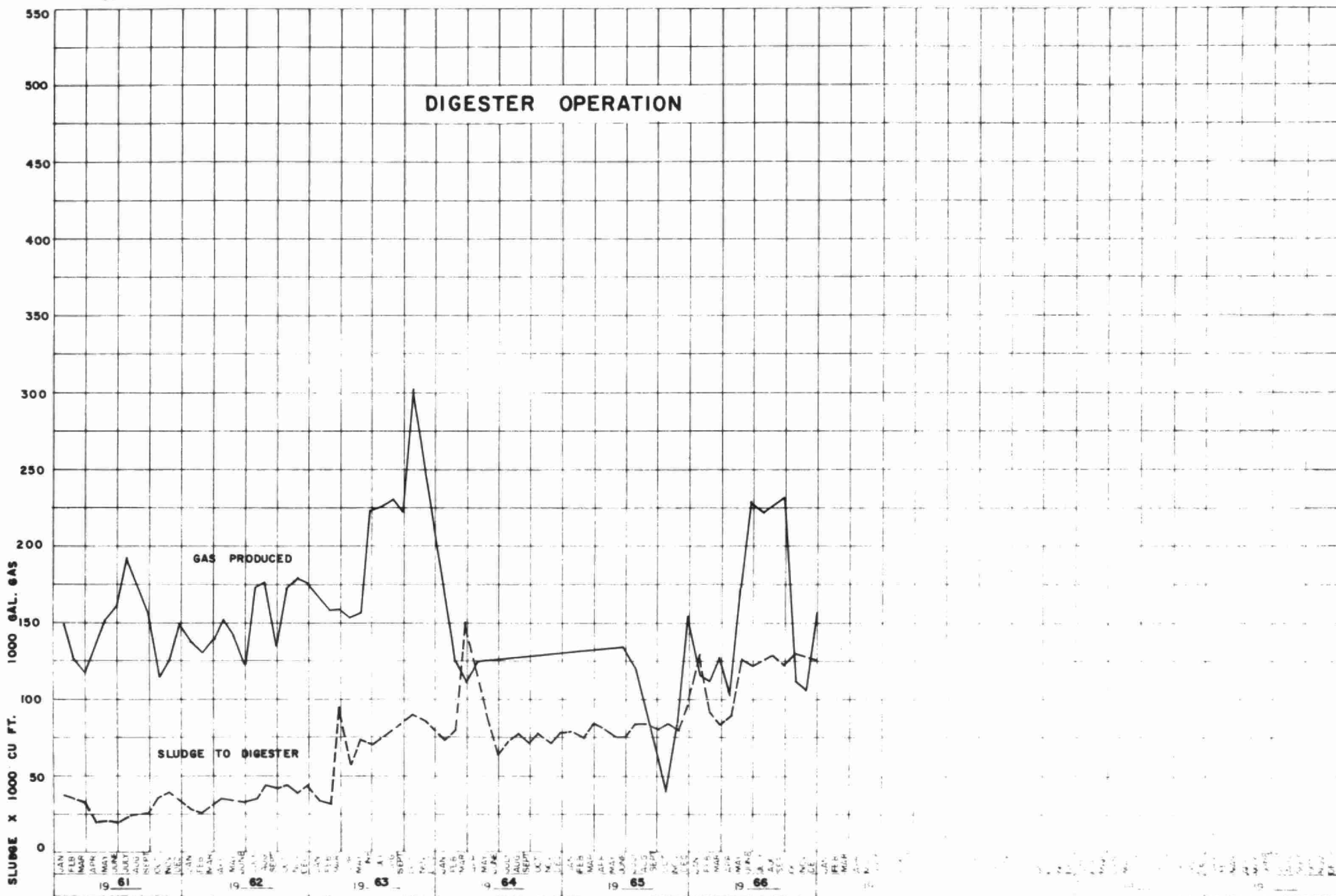
\* Estimated on prorated flow.

## COMMENTS

The concentrations of BOD and SS in the waste from the Trenton WPCP in 1966 were 284 ppm and 215 ppm respectively. These results were obtained from twelve eight-hour composite samples gathered in Trenton and submitted to the OWRC Laboratory for analysis. The BOD of the waste decreased somewhat in 1966 but the SS increased in 1966. The BOD and SS in the plant effluent were 109 ppm and 79 ppm respectively. This was a percent reduction in BOD of 61.5 and an SS reduction of 63 percent.

The total amount of grit removed from the waste in 1966 was 538 cubic feet. This is a considerable decrease from the 910 cubic feet of grit removed in 1965.

The efficiency of treatment was well within accepted standards of a primary treatment plant.



## DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu. Ft.
	1000'S CU. FT.	% SOLIDS	% VOL. MAT.	1000'S CU. FT.	% SOLIDS	% VOL. MAT.	
JAN.	20.27	1.58	1.29	-	8.88	4.96	116.02
FEB.	13.29	3.19	2.38	1.76	8.20	7.86	112.72
MAR.	13.51	2.27	1.76	4.25	8.52	4.45	127.20
APR.	14.38	5.71	4.57	2.88	6.07	3.39	103.36
MAY	202.27	1.30	0.99	-	8.68	4.50	173.51
JUNE	19.73	0.85	0.62	2.00	6.50	3.20	288.44
JULY	20.27	-	-	-	8.08	3.81	224.60
AUG.	20.58	3.00	2.13	-		5.00	274.42
SEPT.	20.00	3.30	2.24	-	9.10	3.26	232.02
OCT.	20.85	2.43	1.70	7.77	15.84	6.01	110.55
NOV.	20.54	2.73	1.74	-	5.75	3.45	105.50
DEC.	20.27	1.81	1.36	-	8.29	3.61	156.05
TOTAL	223.96	-	-	18.66	-	-	2024.39
AVG.	18.66	2.56	1.73	1.56	8.83	4.46	168.70

### COMMENTS

During 1966, a total of 224,000 cubic feet of raw sludge was pumped to the digesters. This sludge had an average solids concentration of 2.56 percent, or an equivalent of 350,000 pounds total solids and 240,000 pounds volatile solids. A total of 18,700 cubic feet of digested sludge was pumped from the digesters. The solids concentration of this sludge averaged 8.8 percent. The total amount of solids was 10,200 and the total amount of volatile solids was 5,200 pounds. The amount of volatile matter destroyed in the digester was 234,800 pounds.

This resulted in a gas production of 8.7 cubic feet per pound of volatile matter destroyed.

## CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	17.80	1369	7.69
FEBRUARY	8.97	1206	13.44
MARCH	18.92	1334	7.05
APRIL	12.30	1270	10.32
MAY	10.16	1349	13.28
JUNE	9.31	1240	13.32
JULY	7.44	1341	18.02
AUGUST	* 19.84	1454	7.33
SEPTEMBER	22.80	1645	7.21
OCTOBER	25.61	1511	5.90
NOVEMBER	34.71	1484	4.28
DECEMBER	45.90	1417	3.09
TOTAL	233.76	16620	-
AVERAGE	19.48	1385	7.11

\* Meter failure, value prorated.

## COMMENTS

Continuous chlorination of the plant effluent was practised at the Trenton WPCP in 1966 for disinfection purposes. An average of 7.11 ppm of chlorine was required to obtain the OWRC objective of 0.5 ppm chlorine residual after a 15 minute contact.



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## RECOMMENDATIONS

The Town of Trenton should continue its program of eliminating storm water from the sanitary sewers.

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